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Checking Schedule for Projected School Buildings

By

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Checking Schedule for Projected School Buildings

A Guide for School Boards and Superintendents

By

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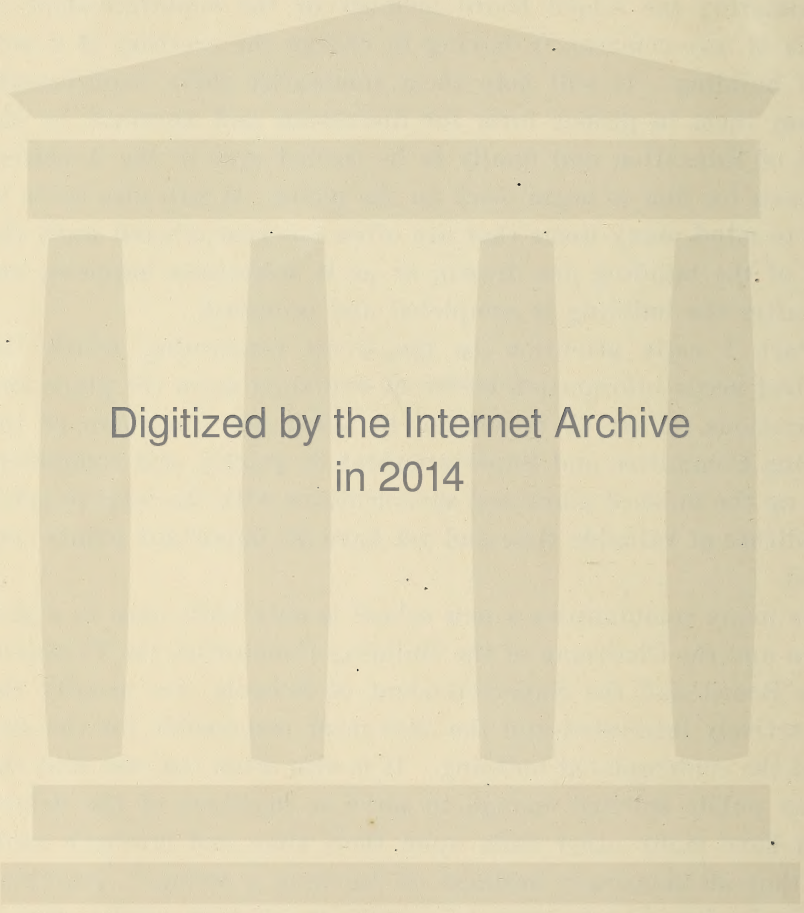
Introduction

This pamphlet is being written with a view of saving the time and assisting the school board member or the superintendent of schools of any community having in charge the erection of a new school building. It will help them summarize their requirements and put them in proper form for discussion and approval by the Board of Education and finally to be turned over to the Architect as a basis for him to begin work on the plans. It will also serve to bring to mind many items that are often not remembered until the plans of the building are drawn, or as it sometimes happens, not until after the building is completed and occupied.

Part 1 calls attention to the items concerning which the Architect needs information before he can start upon the plans and specifications. Part II is written to assist the Chairman of the Building Committee and Superintendent to quickly and completely check up the finished plans and specifications with the least possible expenditure of valuable time and yet have all important points considered.

In many communities a new school is only built once in a generation and the Chairman of the Building Committee, the President of the Board and the Superintendent of Schools, are usually the most actively interested and the ones most responsible for the success of the contemplated building. It is also often the case that the persons public spirited enough to serve as members of the School Board have many other calls upon their time and strength aside from that all-important business of "earning a living." Anything that can be done to help these conscientious and busy public officials get for their community a complete and up-to-date school building with as little effort as possible, is well worth while. It is hoped that the data and suggestions here presented will in a measure serve this purpose.

—J. O. B.



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PART I.

Information Needed by the Architect to Start Preparation of Plans and Specifications for a New School

The Architect at the very start of the work needs certain information in order to properly begin the preparation of the plans. This information must be furnished him by the Board of Education after careful consideration, and after consultation with the Superintendent of Schools. Some of the items in the list given below are educational and refer to the organization and policy of the school system, others are strictly constructional and have reference to the design of the school building.

One of the first things that should be furnished the Architect is a "Program" showing the course of study to be taught, the length of class periods, and the number of pupils to be accommodated in each subject. It is impossible to properly design a school building unless it is determined beforehand what subjects are to be taught and a definite "Program" has been laid out.

To assist in making up a list of requirements for the new school building one scheme which has been carried out successfully in a large school organization is to have the Superintendent send out a questionnaire to principals, supervisors, heads of departments and teachers who will be located in the new building, inviting their views and suggestions regarding the new building. The results of the answers to the questionnaire and discussions which follow are summarized and placed before the Board for consideration. If real progress is to be made in schoolhouse planning the suggestions and recommendations of the teachers who actually live and work in the buildings we construct, must be obtained, considered and followed, where, in the final judgment of the Board of Education it may seem wise so to do.

Memoranda

List of Items Concerning Which the Architect Needs Information

KINDS OF SCHOOL:

Consolidated Schools?
Grade School?
Junior High School?
Senior High School?
Manual Training or Commercial High School?
Vocational High School?

ORGANIZATION OF SCHOOL:

Scheme of organization should be stated:
Standard school program?
Platoon, Duplicate, or Modified "Gary" System?
Should the 6—6, 6—2—4, or 6—3—3 plan of organization be installed?

CAPACITY OF BUILDING:

Total number of pupils for which accommodations are now required?
Probable number of pupils in each subject?
Number of pupils in various class units?
Provision for pupils in classrooms over and above present requirements, to take care of the normal increase for the next few years, without building any new addition to school?

SCHEME OF STUDY ROOMS:

Number of Study Rooms and seating capacity of each?

STORAGE ROOMS FOR BOOKS AND STATIONERY:

State desired number, size, and preferred location?

RULES FOR COMPUTING NUMBER OF PUPILS ACCOMMODATED IN A SCHOOL BUILDING.

The American Institute of Architects and the Committee on Standardization of School Buildings of the National Education Association have both adopted the following method:

"Compute the number of pupils normally accommodated in rooms designed for classes only. Special rooms are to be

figured at the actual number of pupils accommodated for one class period only. Auditoriums and assembly rooms are to be ignored, but gymnasiums may be figured for one or two classes, as the accommodations may provide. No gymnasiums, however, shall be accredited with two classes, if below 40 by 70 feet in size."

It should be noted that the pupil capacity of a building computed on the basis given above represents a maximum capacity. It is not altogether desirable to begin the use of a new school building counting upon such rooms as laboratories, shops and other special rooms as home seats. After the school has been built a few years and before an addition can be constructed it is often necessary to use these special as home seats or stations for pupils, at which time the maximum pupil capacity will be reached. Pupil capacity can possibly best be stated as "maximum pupil capacity," in accordance with the A. I. A. and N. E. A. rules and upon which the cost per pupil is figured, and "normal pupil capacity," which is the desirable number of pupils any school building will accommodate.

Number and Sizes of Rooms
For Different Purposes:

Number of standard classrooms and sizes of each?
Number of recitation rooms and sizes of each ?
Number and kind of special rooms and sizes of each?
A school building should be so constructed that changes in sizes of rooms may be easily made to take care of future educational requirements.

Auditorium:

Total seating capacity?
Located on first or ground floor?
Number of seats desired on main floor?
Number of seats desired in gallery, if any?
Main floor to be flat or sloping?
Area desired for stage?
Shall stage be arranged for scenery?
Pipe organ?
Built in fireproof moving picture booth?
Provision for darkening interior of Auditorium in daytime for moving pictures?

Easily accessible for Citizens' Meetings, or other outside purpose in evenings, or other times without opening up entire building?

Heating and Ventilating systems separate from rest of building so room need only be ventilated when actually in use by a large number of persons?

Will Auditorium be used for any other purpose such as gymnasium or study hall?

GYMNASIUM:

Size and height?

Spectators' gallery and number of seats in same?

Will more than one gymnasium be required or an additional exercise room be needed?

Arrangement of Locker, Dressing and Shower Rooms, approximate size and number of lockers and showers desired in each.

Physical Director's Office?

Drinking fountain in Gymnasium?

Apparatus storage room?

Physical and Medical Examination Rooms?

Gymnasium accessible from outside for community uses without opening main part of building?

Rifle Range?

Wrestling, Boxing, or Lecture Rooms?

Running Track?

Note that minimum size of a standard basket ball court is 35′ x 60′, maximum size, 50′ x 90′. A space of at least 3′0″ should be allowed all around court.

Swimming Pool?

LIBRARY:

Size and preferred location?

Number of books at present in school library and probable maximum number in future?

For school use only, or also a circulating Library?

If circulating community Library, provision should be made for its use outside school hours, evenings and holidays. Also provision for heating without running main heating plant.

Library Stack Room?

Library Work Room?

Library may also be used to advantage for teachers' meetings, and school and community club meetings.

LABORATORIES:

Kinds of Laboratories?
Number, size, and preferred location?
Number of pupils to be accommodated at one time in each?
Equipment?

LECTURE ROOMS:

Number, size, use and preferred locations?
Seats on raised platforms?
Pupils to be accommodated in each?
Equipment?

SPECIAL ROOMS:

Number, size, and preferred location of all special rooms such as:

Bookkeeping
Stenography
Typewriting
School Bank
Music Rooms
Domestic Science Department
Laundry
Model Apartment
Sewing Room
Fitting Room
Men Teachers' Room
Women Teachers' Room
Girls' Rest Room
Medical Inspection Rooms
Dental Clinic Room
Play Rooms
Woodworking Shop
Machine Shop
Sheet Metal Shop
Forge Shop
Printing Shop
Agriculture
Bicycle Room
Kindergarten
Mechanical Drawing Room
Freehand Drawing Room
Arts and Crafts Room
Museum
Janitor's Room
Conservatory
Principal's Office
Superintendent's Office
Board of Education Rooms
Secretary's Office
Open Air Rooms.

State number of pupils to be accommodated at one time; approximate size and preferred location of each room; also, description of special equipment and accessories.

Lunch Room:

Provision for preparing and serving lunches to scholars and teachers?

Number of pupils to be seated at one time, and preferred location of room?

Types of Wardrobes and Method of Taking Care of Pupils' Clothing:

Wardrobes in rooms?

Separate Cloak Rooms adjoining Classrooms?

Steel Lockers in basement or elsewhere?

Any other special arrangement desired?

Provision for Extension of Building to Take Care of Future Growth:

Buildings under twenty classrooms in size and in many cases larger ones, should always be designed so that additions to same can be easily built. It is recommended that a future addition be actually drawn out on the preliminary sketches for future reference. Later Boards of Education can then see what was contemplated in the way of an addition when the building was planned, and whether they follow it in all its details or not, they at least have a basis to start to work on.

Money Available:

For building.....$.....
For driveways, paths and grading property.....$.....
For Architects' fees.....$.....
For furniture and equipment.....$.....
Surplus for contingencies.....$.....
Total.....$.....

When Is It Desired to Have School Building Completed?

It must be remembered that for a medium size brick building it takes from two to three months to prepare plans and specifications, and from eight months to one year to build the school, depending upon its size.

Survey of Property:

It is the duty of the Board of Education to furnish the Architect with a complete topographical survey of the property. This survey should give dimensions, levels, show streets, locate all trees and existing buildings, gas mains, water main, sewers, electric mains, and kind of current available; also any peculiar features of the property, or any restrictions applying to same.

Test Borings:

The Board of Education should have test borings made or test pits dug to determine the character and bearing capacity of the soil; also to locate the level of sub-surface water, and the location of rock if any. Neglect to determine the character and depth of the underlying soil, has many times been the cause of great expense, later on, when the construction of the building was under way.

Work to Be Included Or Not Included in Contract?

Are lighting fixtures to be included or purchased later?
Are window shades to be included or purchased later?
Is entire property to be graded or only just around building?
Are road, paths, and sidewalks, to be included?
Is the building contract to include furniture and equipment or any special items of same?

Insurance on Building During Construction:

The Board of Education usually insures the building against fire and tornado, during construction; for the benefit of all parties concerned as their interests may appear at the time of loss. Liability insurance and damage to persons or property is carried by the contractor.

Method of Making Payments to Contractors:

This is usually done monthly, upon certificate of the Architect and equal to 85% of the value of labor and material actually incorporated into the building at the time of calculat-

ing payment. The remaining 15% accumulates as a final payment, which is generaly made within 30 days after completion and acceptance of the building by the Board.

MATERIALS TO BE USED IN THE BUILDING:

Kind of face brick and exterior trim?
Kind of floor construction?
Fireproof or semi-fireproof construction?
Materials of roof?
Kind of wood for inside trim?
Kind of wood for Classroom floors?
Kind of floors in Corridors?
Kind of floors and wainscoting in Toilet Rooms?
Type of windows—double hung, hinged, or pivoted?
Kind of stairs?
Etc., etc., etc.
By reading over Part II certain items may be noticed concerning which it is desired to give special instructions at the time the plan and specifications are started.

BOOK LIFTS, DUMB WAITERS, DUST CHUTES:

If any are required, number, size and location should be stated. Vertical shafts and doors to same should in all cases be fireproof.

WAINSCOTING IN CORRIDORS OR CLASSROOMS:

Lower walls of classrooms and especially corridors are subjected to heavy wear and abuse. Wainscoting of painted burlap is often used in classrooms and glazed brick about 5′ 0″ high in corridors.

SOUND DEADENING OF FLOORS OR PARTITIONS:

Certain floors and partitions such as the floor of a gymnasium where located over an auditorium, or a Toilet Room adjoining a Classroom, need to be insulated and have sound deadening. There may also be other cases where such sound deadening is required as, for instance, around Music Rooms, Gymnasium, noisy Shops, etc.

When the above instructions and special information has been given the Architect, he can then proceed with the preparation of the plans and specifications. He will first make Preliminary Plans and Specifications which will be submitted to the Board of Education and Superintendents, for their criticism and approval, and any changes can easily be made at that time.

Preliminary plans and specifications are just what their name implies, and are easily modified or changed. Give enough time and study to the preliminary sketches so as to be entirely satisfied, before approving them. Don't wait until the final plans and specifications are all completed and ready to be sent out for estimates, and then decide to make changes. This not only causes delay, but also means an additional charge by the Architect for changing completed plans and specifications, which are always prepared along the lines of the approved preliminary sketches.

PART II.

Outline of Items for Checking Plans and Specifications

After the Preliminary Plans of the proposed school building have been submitted by the Architect, and approved by the Board of Education and the Superintendent, the Architect proceeds with the preparation of final estimating and working drawings. When these estimating plans and specifications are completed, they are usually submitted to the Board of Education and Superintendent for final approval and authority to advertise for bids and to send them out to Contractors for estimates.

Blueprints of the final plans and specifications for approval should be left with the Board and ample time given to carefully look over same, by the Superintendent and Board members having the matter in charge. Any fundamental changes should always be made in the Preliminary Plans and only slight corrections, if found absolutely essential, should be made in these final plans.

After the estimating drawings are issued, to the Contractors, no changes should be made. If mistakes or discrepancies are discovered, this can be taken care of by mailing a "Bulletin" to each Contractor figuring, which Bulletin is afterwards made part of the contract. The law requires that a contract must be let in strict accordance with the plans, specifications and estimate submitted. After the award of the contract and start of construction changes should be avoided. Changes at this time are liable to lead to disputes, misunderstandings, and very often to excessive extra costs.

It is the duty of the School Board and Superintendent to know in a general way what the plans and specifications include or omit, and satisfy themselves that special items which they have discussed from time to time during the preparation of the plans have been properly taken care of. It is practically impossible for the busy Superintendent and the busier School Board members to read thru the entire specifications and to see and check up everything on the plans. In fact, if they did have the time, they would find that the greater part of the plans and specifications were of a technical nature, of no interest to the laymen, and not easily understood by him.

Ambitious School Superintendents or Building Committee Members often take home the plans and specifications with the idea of reading them thru, word for word. After conscientiously reading the first fifteen or twenty pages out of a hundred or more, they find that the technical nature and volume of the pages makes it practically impossible to make any headway, or get a clear understanding of what the plans and specifications actually call for. It is with the idea of simplifying this procedure and giving the Superintendent and the Board members, the information with a minimum amount of labor, that the memoranda given below have been prepared.

The examination and approval of the plans by the Superintendent is not with the idea of relieving the Architect of any of his responsibilities. It is the Architect's duty to see that the plans and specifications are complete and agree with each other, and that the State and Local Laws applying to School Buildings have been complied with. Also that the instructions given from time to time by the Board, as to arrangement, materials or finishes, are carried out, and that a complete, substantial and safe building is produced when the plans and specifications are executed in brick, stone and mortar.

The list given below will be of assistance in helping to check important points covered by the plans and specifications, without the necessity of reading through the specifications word for word. If the persons in authority will make sure that the various items mentioned in this list are taken care of as they desire them, they will have gone a great way towards obtaining a building that will meet with their special requirements.

In case you cannot find in the plans and specifications some of the items mentioned below, ask your Architect to point out the same to you, or if omitted to explain how he proposes taking care of the same.

The list could very well be supplemented by reading over the "Score Card of the City School Building" and "Score Card of Rural School Building" together with the explanations that accompany same, as prepared by Dr. George D. Strayer, Professor of Educational Administration, Teachers College, Columbia University, New York City. These score cards suggest many items to investigate and be sure are properly taken care of where same apply to your building.

General

See that instructions as to number of Classrooms, and Special Rooms are carried out on plans.

See that the instructions as to Method of Making Payments to Contractors, Time of Completion of Building, Insurance, etc., are carried out in the specifications.

Check up the corporate name of the Board of Education mentioned in the specifications as Owner of the proposed building. This is often wrongly stated.

Decide who furnishes and pays for water, light, and heat, used during construction of the building—the Owner or the Contractor?

See that specifications require Contractor to file plans and obtain and pay for Building Permit, or that it is otherwise properly taken care of.

Provision for temporary office for Contractor with telephone connection, during construction of building?

See that temporary toilet facilities are provided for workmen from start to completion of job.

Investigate cutting down of certain trees within the area of new building and the boxing around or protecting of these trees which are to remain.

Removal of any old building on site and disposal of old material. Is it desired to save any old materials?

Masonry

Provision in the specification if rock is encountered in excavations? (It is usual for Contractors to estimate on excavations of ordinary clay, stating an extra price in their estimate per cubic yard if rock is encountered).

Provision in specification for keeping excavations free from water if same is encountered while digging?

What measures have been taken to make walls and floors of rooms below grade waterproof?

Do soil conditions make a tile sub-surface drain necessary around the building?

What quality of lime, sand and cement has been specified?

Cement sidewalks, paths and drives?

Composition of Mortar:

Usually 1 part cement, 3 parts sand, and 10% lime putty.

Composition of Concrete:

A good mixture is 1 part cement, 3 parts sand and 5 parts broken stone.

Take Note Where Cement Floors Are Called For on Plans and Specifications:

Consult Architect and learn location where any special kind of floor has been used other than the ordinary wood floor. The School Board is often surprised on completion of building to find that a cement floor has been laid in a Manual Training Room where sharp tools are used and sometimes dropped and ruined, and wood floor in the Forge Room where hot coals fall on the floor. Special notice should therefore be taken about materials of finished floors in all rooms and spaces.

Take Note Where Fireproof Floor Construction and Roofs Are Called for:

In a fireproof building it is assumed that all floor construction is fireproof, altho the roof construction is sometimes built of heavy timber to save money. In a semi-fireproof building it is usual to make the Corridors and Stairs fireproof, and also floors and ceilings of Boiler Room and Manual Training Room fireproof. Other construction of wood.

Look Up Kind of Materials Used in Outside Walls Above and Below Grade:

Concrete, stone, brick, terra cotta blocks, wood, etc.?

Materials of Inside Partitions and Where Do Fireproof Walls Occur?:

Minor interior partitions are usually wood in a semi-fireproof building, and brick, terra cotta, plaster block, etc., in a fireproof building. In a semi-fireproof building certain interior partitions should be fireproof such as enclosing walls of Boiler Room, Manual Training Rooms, Corridors, Stairs, etc. It is well to know just where these occur.

What Outside Face Brick Has Been Specified?:

Have sample submitted for approval of Board.

What Outside Trim Has Been Specified?:

Stone, terra cotta, copper, galvanized sheet iron, wood, etc. Have sample submitted for approval if stone or terra cotta.

What Spaces or Rooms in Building Have the Brick or Terra Cotta Walls or Ceilings Left Exposed Without Plaster?:

The Board and Superintendents are often surprised when going through a finished school building to find certain rooms not plastered. This is as it should be in certain rooms, such as Store Rooms, Play Courts, Boiler Room, etc., but all such unplastered spaces should be checked up and agreed to.

Inquire How Building Is Damp-Proofed Above Grade:

All outside walls whether brick, terra cotta block, or concrete, should be furred. That is, the inside plastering kept 1″ or more away from the inside face of outside wall, thus leaving an air space and preventing moisture from penetrating outside walls and through plaster into finished rooms.

Kind of Plaster Specified:

"Old Fashion" mortar is where lump lime is slacked and sand hair mixed into same by hand. This takes considerable time, as the slacked lime must be given opportunity to cure and cool, (not less than 30 days). It is also difficult to be assured of correct proportions and too much sand is often used.

Factory mixed "Patent Plaster" has the sand and hair accurately mixed with the lime at the mill. It is put up in bags and shipped direct to the job and only needs the addition of water to make it ready for immediate application. While a little more expensive than "Old Fashion" plaster, it is a much more scientific mixture.

Kind of Lath Specified:

Metal lath is always used in fireproof buildings. In semi-fireproof buildings, wood lath is used on partitions, but it is preferable to use metal lath on ceilings. Strips of metal lath should also be used where wood lath comes up against a brick wall, so as to avoid cracks caused by the shrinkage of the wood.

Metal Corner Beads:

Should be specified for all external angles in plaster work.

Finish of Plaster:

Smooth or sand finish? Smooth finished plaster is generally used and is to be preferred as it is more sanitary than the rough sand finish.

Miscellaneous Iron Work

Main Stairs:

May be reinforced concrete or iron.
Height of risers and width of treads?
Risers not over 7″ high.
Treads not less than 12″ wide.
No open well hole should be permitted between flights on account of fire or smoke.
Balustrade rails at side should be not less than 5′0″ high to prevent accidents.
Hand rails should be provided on both sides of all flights of stairs.
Any iron stairs or iron ladder to roof?
Stairs should be shut off from corridors with fireproof smoke screen.

Miscellaneous:

Ash lift or other provision for getting ashes out of Boiler Room?
Are outside woven wire window guards specified for all ground floor windows?
Have coal holes or coal chutes been called for?
Any folding iron gates across corridors desired to cut off certain portions of building when Auditorium or other rooms are being used at nights?
Any iron fence called for around playgrounds and rest of property?
Any iron fire escapes?
Mud scrapers and mats at entrance doors?
Any fireproof record vault required?

Roofing and Sheet Metal

Kind of roofing used in various places, such as tin, copper, pitch, felt, and slag, etc.

Material of flashings, gutter, and down spouts? (Should be copper).

Material of any metal cornices or other ornamental features on exterior? (Should be copper).

Type of skylights used? Wire glass used for glazing with woven wire guards over same for protection.

All roofing and skylight work should be guaranteed by contractor as watertight for a period of years; with repairs made free of cost to Owners in case of leaks occurring during period of guarantee.

Carpentry

Kind of wood and quality of same for Classroom floors? (Usually rift sawn yellow pine or clear maple).

Kind of floors used in Corridors? (Wood, asphalt, cement, composition, linoleum, etc.)

Single or double floors used where wood floors are called for?

Bolts for window cleaner's belt on outside of all window frames, above ground floor?

Kind of windows specified—double hung sash, casement, revolving, or some special type?

Has sash cord or sash chain been specified for double hung windows?

Window frames caulked with oakum, and sash equipped with metal weather strips, to prevent excessive air leakage?

Kind of interior wood trim?

Location of picture moulding?

Kind of doors? Flush surface hospital type with glass panel in upper portion, or ordinary panelled wood door?

Kind of blackboards and their location? Slate or composition?

Type of chalk troughs? Height of chalk troughs above floor?

Cork display board in Classrooms and bulletin board in Corridors?

Dressers and cupboards in special rooms?

Any folding or rolling partitions required between Classrooms?

Are partitions between toilet fixtures wood, metal, soapstone, slate, etc.?

Bookcase and Teachers' Closets in each Classroom?

Special shelving in closet or store rooms?

Metal covered doors to Boiler Room and Manual Training Rooms, closing off same from Corridors and Basement?

Metal covered partitions and doors glazed with wire glass enclosing staircases and acting as a smoke and fire screen?

HARDWARE:

Materials and quality?

Solid bronze or brass hinges on outside doors, plated brass on inside doors?

Key system for various rooms and master key for all doors?

Special locks for Special Rooms, such as Principal's Office, Laboratory, etc.

Numbers on doors to classrooms?

Panic bolts required on all outside doors.

Any spring checks desired on outside or inside doors to keep same closed?

Metal kickplates required across bottom of certain doors?

Painting

Materials and quality of same?

Number of coats of paint called for by specifications on wood, iron and plaster?

Samples of interior wood finish to be made for the approval of the Board?

Plaster walls painted and where?

Painting of brick walls and where?

Painting of cement floors. Where and what material used?

Lettering of doors to various rooms?

Special decorative painting of Auditorium and Main Entrance Hall?

GLAZING:

Quality of glass used in outside windows?

Quality of glass used in exterior and interior indoors?

Obscure glass used in such place as Toilet Room windows, Shower and Locker Rooms, etc.

Wire glass for fireproof partitions, doors, and stair enclosures?

Leaded Glass?

Plumbing

Any hot water heating apparatus? Kind, size and location?

Location of fixtures to be supplied with hot water?

Is plumbing a cast iron or screw pipe job?

Disposal of rain water on surface of ground, or into sewer?

Pipe covering on hot and cold water and steam pipes?

Tests of system as required by local Board of Health?

Is hot water a circulating system or only a single pipe system?

Connections on outside of building for water hose?

Are fire line stand pipes and hose reels called for in corridors?

Plumbing fixtures? Examine illustration, or preferably see samples of all plumbing fixtures?

Water closet with seat action and pressure water tanks are to be preferred. Seats with open cut in front also preferred.

Individual white porcelain urinals about 4′6″ high are to be preferred to the ordinary slate or soapstone urinal.

Look up location of Toilet Rooms and number of fixtures in each?

Location and number of drinking fountains?

Any floor drains called for in Toilet Rooms or Basement?

Any automatic cellar drain called for as required?

Number and location of shower baths?

Any water filters, storage tanks, pumps, etc. required?

Sewerage disposal plant required where no sewers are available.

Inside cast iron rain water leaders from roofs or outside sheet metal leaders?

Any laundry tubs desired in connection with Domestic Science Room?

Any pipes running through cold air rooms or any unheated spaces should be carefully covered to prevent freezing.

Vacuum Cleaning System:

Type of machine? Portable or stationary?

Capacity of machine? Number of sweepers that can be used at one time?

Location of outlets?

Number of sets of hose and tools furnished?

Gas Piping:

Check location of emergency gas outlets in corridors, stairs, auditorium, etc.

Provide gas outlets in Laboratories, Lunch Room, Domestic Science Room, Boiler Room, Teachers' Room, etc.

Location of gas meter and approval of piping installation by local gas company?

Electric Work

Architect must obtain full information as to the kind of current and its phase and voltage furnished by the local Lighting Co.

Check up number of lights in Classrooms?

See how lights in Classrooms are controlled, either by local switch in Classroom or from panel boards in Corridors?

Any outside lights at entrance?

Base receptacles where needed?

Electric outlets for special furniture in Laboratories, Demonstration Tables, etc.

Outlet for motion picture or stereopticon machine?

Lights in Auditorium controlled by one main switch located near moving picture machine, in addition to switches in Dressing Room off the stage. At times it is necessary that moving picture operator be able to turn off and on Auditorium lights, as for instance when film breaks, lights should be turned on and off again by Operator when film is repaired.

Footlights on stage or side and overhead lights around prosenium arch. Provide plenty of overhead lighting on Stage so chorus or orchestra will have no trouble reading their music.

Location of program bells and how operated; by a program clock or hand push button?

Electric power for motors, fans and vacuum cleaner?

Outside door push button ringing bells in front Corridor and Boiler Room.

Special program bells in noisy rooms?

Push button and buzzer from stage to stereopticon location?

Fire alarm bells and their location? How operated?

Bells, telephones and clocks operated by dry batteries or storage batteries.

Long distance outside telephones?

Any interior telephone system? Location of central switchboard for interior telephone system?

Number and location of interior and outside telephones?

Number and location of secondary clocks in Classrooms which are operated by master clock in Principal's Office?

Location of master clock, program bells, switchboard, fire alarm switchboard, telephone switchboard? (Usually in Principal's outer office).

Any electric outlets required for electric irons or electric stoves?

Kind and design of lighting fixtures?

Is electric service wire from street main run exposed overhead on poles or concealed in conduit below ground?

Underwriters' Certificate of Inspection approving wiring installation, to be obtained by Contractor and filed with Board of Education before final payment is made on contract. This certificate is needed in connection with fire insurance policy on building.

Heating and Ventilating

General description of system?

Kind of piping system: one pipe, two pipe, vapor or vacuum system?

Are fans used for either or both the fresh air supply and exhaust ventilation?

Type of boiler or furnace?

Kind of boiler grates—stationary or shaking grates? Kind and size of coal to be burned? Boiler grates should be suitable for kind of coal to be used. Oil burning boilers in certain localities.

Special provision for heating up Principal's Office, Board of Education, Superintendent's Office during winter holidays and evenings, so entire building will not have to be heated? ("Gas-steam" radiators good for this purpose).

Is automatic temperature control called for? What sections are so controlled?

Quality of valves specified?

Quality of pipes specified?

Are Toilet Rooms specially ventilated independent of school ventilation?

If hot air blast system of heating is used, are direct radiators installed in rooms where water is located to prevent freezing during nights, Sundays and holidays?

Kind of air valves used: is an air line system specified with or without vacuum pump?

Is piping system valved for separate control of direct radiator in Classrooms, Auditorium, etc., and for indirect air heaters for ventilation. Also so sections of building can be shut off in case of accident to any part of system?

Is ventilation of Classrooms and Auditorium controlled separately so that either section can be used without the other?

Types of radiators specified—wall or floor?

Any provision for humidifying air?

Any air washers?

Are all pipes covered?

All exposed pipes and radiators painted or bronzed?

Note—The Ventilating of school buildings is not an exact science where definite results can always be depended upon. It should therefore be designed and its installation supervised by a competent Heating and Ventilating Engineer, of ability and judgment. It is bad practice to have Steam Heating Contractors, Material Men, or anyone else who has something to sell, lay out the heating and ventilating plans and specifications. Heating and Ventilating systems have been subjected to a great deal of criticism, and no trouble or expense should be spared to get a layout adapted to the special building in hand. After the building is completed it should be operated by someone who knows more about a heating and ventilating plant than merely shoveling coal into the boilers.

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